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☑ Final Report
☐ Re-Issued Report
☐ Revised Report

Report Date:
10-Nov-16 15:07

Laboratory Report

Gulf Oil L.P.
281 Eastern Avenue
Chelsea, MA 02150
Attn: Andrew P. Adams

Project: Gulf Terminal - Chelsea, MA
Project #: Gulf Chelsea

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SC27780-01	Outfall 003	Surface Water	28-Oct-16 12:30	31-Oct-16 16:44

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

June O'Connor
Laboratory Director

Eurofins Spectrum Analytical holds primary certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 11 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our 'Quality' web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

The samples were received 0.8 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

Analyses for Total Hardness, pH, and Total Residual Chlorine fall under the state of Pennsylvania code Chapter 252.6 accreditation by rule.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

SW846 8260C

Calibration:

1611006

Analyte quantified by quadratic equation type calibration.

Naphthalene

This affected the following samples:

1619121-BLK1
1619121-BS1
1619121-BSD1
Outfall 003
S609436-CCV1
S609464-ICV1

Sample Acceptance Check Form

Client:	Gulf Oil L.P.
Project:	Gulf Terminal - Chelsea, MA / Gulf Chelsea
Work Order:	SC27780
Sample(s) received on:	10/31/2016

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
Were custody seals present?	☐	☑	☐
Were custody seals intact?	☐	☐	☑
Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
Were samples refrigerated upon transfer to laboratory representative?	☑	☐	☐
Were sample containers received intact?	☑	☐	☐
Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
Were samples accompanied by a Chain of Custody document?	☑	☐	☐
Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
Did sample container labels agree with Chain of Custody document?	☑	☐	☐
Were samples received within method-specific holding times?	☑	☐	☐

Summary of Hits

Lab ID: SC27780-01 **Client ID:** Outfall 003

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Oil and Grease by EPA 1664A	< 1.4		1.4	mg/L	E1664A
Total Suspended Solids	1.9		0.5	mg/l	SM2540D (11)

Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Outfall 003	Gulf Chelsea	Surface Water	28-Oct-16 12:30	31-Oct-16
SC27780-01				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Volatile Organic Aromatics by SW846 8260 Prepared by method SW846 5030 Water MS													
71-43-2	Benzene	< 1.0		µg/l	1.0	0.3	1	SW846 8260C	02-Nov-16	02-Nov-16	TS	1619121	
91-20-3	Naphthalene	< 1.0		µg/l	1.0	0.3	1	"	"	"	"	"	
Surrogate recoveries:													
460-00-4	*4-Bromofluorobenzene*	*99*			*70-130 %*			"	"	"	"	"	
2037-26-5	*Toluene-d8*	*99*			*70-130 %*			"	"	"	"	"	
17060-07-0	*1,2-Dichloroethane-d4*	*102*			*70-130 %*			"	"	"	"	"	
1868-53-7	*Dibromofluoromethane*	*97*			*70-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
50-32-8	Benzo (a) pyrene	< 0.051		µg/l	0.051	0.037	1	SW846 8270D SIM	03-Nov-16	07-Nov-16	MSL	1619194	
91-20-3	Naphthalene	< 0.051		µg/l	0.051	0.027	1	"	"	"	"	"	
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*50*			*30-130 %*			"	"	"	"	"	
General Chemistry Parameters													
	pH	**7.60**		pH Units			1	ASTM D 1293-99B	01-Nov-16 10:40	01-Nov-16 10:40	TY	1619080	X
	Total Suspended Solids	**1.9**		mg/l	0.5	0.2	1	SM2540D (11)	02-Nov-16	03-Nov-16	CMB	1619128	X
Subcontracted Analyses													
Prepared by method 365564													
*Analysis performed by Phoenix Environmental Labs, Inc. * - MACT007*													
	Oil and Grease by EPA 1664A	**< 1.4**		mg/L	1.4	1.4	1	E1664A		04-Nov-16 08:19	MACT0	365564A	

Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1619121 - SW846 5030 Water MS										
Blank (1619121-BLK1)					Prepared & Analyzed: 02-Nov-16					
Benzene	< 1.0		µg/l	1.0						
Ethylbenzene	< 1.0		µg/l	1.0						
Methyl tert-butyl ether	< 1.0		µg/l	1.0						
Naphthalene	< 1.0		µg/l	1.0						
Toluene	< 1.0		µg/l	1.0						
m,p-Xylene	< 2.0		µg/l	2.0						
o-Xylene	< 1.0		µg/l	1.0						
Surrogate: 4-Bromofluorobenzene	*49.2*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: Toluene-d8	*50.3*		µg/l		*50.0*		*101*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*51.3*		µg/l		*50.0*		*103*	*70-130*		
Surrogate: Dibromofluoromethane	*47.8*		µg/l		*50.0*		*96*	*70-130*		
LCS (1619121-BS1)					Prepared & Analyzed: 02-Nov-16					
Benzene	**20.9**		µg/l		20.0		105	70-130		
Ethylbenzene	**21.4**		µg/l		20.0		107	70-130		
Methyl tert-butyl ether	**19.8**		µg/l		20.0		99	70-130		
Naphthalene	**20.7**		µg/l		20.0		103	70-130		
Toluene	**20.0**		µg/l		20.0		100	70-130		
m,p-Xylene	**21.2**		µg/l		20.0		106	70-130		
o-Xylene	**21.5**		µg/l		20.0		107	70-130		
Surrogate: 4-Bromofluorobenzene	*51.6*		µg/l		*50.0*		*103*	*70-130*		
Surrogate: Toluene-d8	*49.8*		µg/l		*50.0*		*100*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*50.8*		µg/l		*50.0*		*102*	*70-130*		
Surrogate: Dibromofluoromethane	*51.6*		µg/l		*50.0*		*103*	*70-130*		
LCS Dup (1619121-BSD1)					Prepared & Analyzed: 02-Nov-16					
Benzene	**20.5**		µg/l		20.0		102	70-130	2	20
Ethylbenzene	**21.2**		µg/l		20.0		106	70-130	0.8	20
Methyl tert-butyl ether	**19.6**		µg/l		20.0		98	70-130	0.9	20
Naphthalene	**21.0**		µg/l		20.0		105	70-130	2	20
Toluene	**20.3**		µg/l		20.0		102	70-130	2	20
m,p-Xylene	**21.4**		µg/l		20.0		107	70-130	1	20
o-Xylene	**21.4**		µg/l		20.0		107	70-130	0.4	20
Surrogate: 4-Bromofluorobenzene	*51.6*		µg/l		*50.0*		*103*	*70-130*		
Surrogate: Toluene-d8	*49.9*		µg/l		*50.0*		*100*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*49.8*		µg/l		*50.0*		*100*	*70-130*		
Surrogate: Dibromofluoromethane	*51.6*		µg/l		*50.0*		*103*	*70-130*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1619194 - SW846 3510C										
Blank (1619194-BLK2)					Prepared: 03-Nov-16 Analyzed: 04-Nov-16					
Acenaphthene	< 0.050		µg/l	0.050						
Acenaphthylene	< 0.050		µg/l	0.050						
Anthracene	< 0.050		µg/l	0.050						
Benzo (a) anthracene	< 0.050		µg/l	0.050						
Benzo (a) pyrene	< 0.050		µg/l	0.050						
Benzo (b) fluoranthene	< 0.050		µg/l	0.050						
Benzo (g,h,i) perylene	< 0.050		µg/l	0.050						
Benzo (k) fluoranthene	< 0.050		µg/l	0.050						
Chrysene	< 0.050		µg/l	0.050						
Dibenzo (a,h) anthracene	< 0.050		µg/l	0.050						
Fluoranthene	< 0.050		µg/l	0.050						
Fluorene	< 0.050		µg/l	0.050						
Indeno (1,2,3-cd) pyrene	< 0.050		µg/l	0.050						
Naphthalene	< 0.050		µg/l	0.050						
Phenanthrene	< 0.050		µg/l	0.050						
Pyrene	< 0.050		µg/l	0.050						
Surrogate: Benzo (e) pyrene-d12	*0.700*		µg/l		*1.00*		*70*	*30-130*		
LCS (1619194-BS2)					Prepared: 03-Nov-16 Analyzed: 04-Nov-16					
Acenaphthene	**0.764**		µg/l	0.050	1.00		76	40-140		
Acenaphthylene	**0.725**		µg/l	0.050	1.00		72	40-140		
Anthracene	**0.833**		µg/l	0.050	1.00		83	40-140		
Benzo (a) anthracene	**0.834**		µg/l	0.050	1.00		83	40-140		
Benzo (a) pyrene	**0.864**		µg/l	0.050	1.00		86	40-140		
Benzo (b) fluoranthene	**0.724**		µg/l	0.050	1.00		72	40-140		
Benzo (g,h,i) perylene	**0.800**		µg/l	0.050	1.00		80	40-140		
Benzo (k) fluoranthene	**0.883**		µg/l	0.050	1.00		88	40-140		
Chrysene	**0.889**		µg/l	0.050	1.00		89	40-140		
Dibenzo (a,h) anthracene	**0.838**		µg/l	0.050	1.00		84	40-140		
Fluoranthene	**0.839**		µg/l	0.050	1.00		84	40-140		
Fluorene	**0.776**		µg/l	0.050	1.00		78	40-140		
Indeno (1,2,3-cd) pyrene	**0.875**		µg/l	0.050	1.00		88	40-140		
Naphthalene	**0.743**		µg/l	0.050	1.00		74	40-140		
Phenanthrene	**0.754**		µg/l	0.050	1.00		75	40-140		
Pyrene	**0.847**		µg/l	0.050	1.00		85	40-140		
Surrogate: Benzo (e) pyrene-d12	*0.700*		µg/l		*1.00*		*70*	*30-130*		
LCS Dup (1619194-BSD2)					Prepared: 03-Nov-16 Analyzed: 04-Nov-16					
Acenaphthene	**0.661**		µg/l	0.050	1.00		66	40-140	14	20
Acenaphthylene	**0.664**		µg/l	0.050	1.00		66	40-140	9	20
Anthracene	**0.754**		µg/l	0.050	1.00		75	40-140	10	20
Benzo (a) anthracene	**0.808**		µg/l	0.050	1.00		81	40-140	3	20
Benzo (a) pyrene	**0.742**		µg/l	0.050	1.00		74	40-140	15	20
Benzo (b) fluoranthene	**0.747**		µg/l	0.050	1.00		75	40-140	3	20
Benzo (g,h,i) perylene	**0.647**	QR2	µg/l	0.050	1.00		65	40-140	21	20
Benzo (k) fluoranthene	**0.743**		µg/l	0.050	1.00		74	40-140	17	20
Chrysene	**0.781**		µg/l	0.050	1.00		78	40-140	13	20
Dibenzo (a,h) anthracene	**0.708**		µg/l	0.050	1.00		71	40-140	17	20
Fluoranthene	**0.761**		µg/l	0.050	1.00		76	40-140	10	20
Fluorene	**0.664**		µg/l	0.050	1.00		66	40-140	16	20
Indeno (1,2,3-cd) pyrene	**0.760**		µg/l	0.050	1.00		76	40-140	14	20
Naphthalene	**0.702**		µg/l	0.050	1.00		70	40-140	6	20
Phenanthrene	**0.694**		µg/l	0.050	1.00		69	40-140	8	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1619194 - SW846 3510C										
LCS Dup (1619194-BSD2)					Prepared: 03-Nov-16 Analyzed: 04-Nov-16					
Pyrene	**0.767**		µg/l	0.050	1.00		77	40-140	10	20
Surrogate: Benzo (e) pyrene-d12	*0.630*		µg/l		*1.00*		*63*	*30-130*		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 1619080 - General Preparation										
Duplicate (1619080-DUP1)			**Source: SC27780-01**			Prepared & Analyzed: 01-Nov-16				
pH	**7.56**		pH Units			7.60			0.5	5
Reference (1619080-SRM1)						Prepared & Analyzed: 01-Nov-16				
pH	**6.05**		pH Units		6.00		101	97.5-102.5		
Reference (1619080-SRM2)						Prepared & Analyzed: 01-Nov-16				
pH	**6.04**		pH Units		6.00		101	97.5-102.5		
Batch 1619128 - General Preparation										
Blank (1619128-BLK1)						Prepared: 02-Nov-16 Analyzed: 03-Nov-16				
Total Suspended Solids	< 0.5		mg/l	0.5						
LCS (1619128-BS1)						Prepared: 02-Nov-16 Analyzed: 03-Nov-16				
Total Suspended Solids	**102**		mg/l	10.0	100		102	90-110		

Subcontracted Analyses - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch 365564A - 365564										
BLK (BV72754-BLK)						Prepared & Analyzed: 04-Nov-16				
Oil and Grease by EPA 1664A	< 1.4		mg/L	1.4	40			-		
LCS (BV72754-LCS)						Prepared: Analyzed: 04-Nov-16				
Oil and Grease by EPA 1664A	**39.10**		mg/L	1.4	40		98	85-115		20

Notes and Definitions

QR2	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
OG	The required Matrix Spike and Matrix Spike Duplicate (MS/MSD) for Oil & Grease method 1664B can only be analyzed when the client has submitted sufficient sample volume. An extra liter per MS/MSD is required to fulfill the method QC criteria. Please refer to Chain of Custody and QC Summary (MS/MSD) of the Laboratory Report to verify ample sample volume was submitted to fulfill the requirement.
pH	The method for pH does not stipulate a specific holding time other than to state that the samples should be analyzed as soon as possible. For aqueous samples the 40 CFR 136 specifies a holding time of 15 minutes from sampling to analysis. Therefore all aqueous pH samples not analyzed in the field are considered out of hold time at the time of sample receipt. All soil samples are analyzed as soon as possible after sample receipt.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

SC 27780

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
- ☑ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed.

Report To: Andrew Adams	Invoice To: Christopher Gill	Project No: Gulf Chelsea
Gulf Oil LP	Gulf Oil LP	Site Name: Gulf Chelsea Terminal
281 Eastern Ave	80 William St, Suite 400	Location: 281 Eastern Ave, Chelsea State: MA
Chelsea, MA 02150	Wellesley, MA 02481-3705	Sampler(s): Andrew Adams
Telephone #: 617.884.5980		
Project Mgr: Andrew Adams	P.O No.: _____ Quote/RQN: _____	

F=Field Filtered **1**=$Na_2S_2O_3$ **2**=HCl **3**=H_2SO_4 **4**=HNO_3 **5**=NaOH **6**=Ascorbic Acid
7=CH_3OH **8**=$NaHSO_4$ **9**=Deionized Water **10**=H_3PO_4 **11**= none **12**= _____

DW=Dinking Water **GW**=Groundwater **SW**=Surface Water **WW**=Waste Water
O=Oil **SO**=Soil **SL**=Sludge **A**=Indoor/Ambient Air **SG**=Soil Gas
X1= _____ **X2**= _____ **X3**= _____

G= Grab **C**=Composite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	List Preservative Code below:								Check if chlorinated
										11	3	2	11					
										Analysis: TSS, pH	O&G	VOCs (benzene & naphthalene)	PAH (benz(a) pyrene & naphthalene)					
27780-01	Outfall 003	10-28-16	12:30	G	SW				1	X								☐
	Outfall 003	10-28-16	12:30	G	SW		1				X							☐
	Outfall 003	10-28-16	12:30	G	SW	3						X						☐
	Outfall 003	10-28-16	12:30	G	SW		1						X					☐
																		☐
																		☐
																		☐
																		☐
																		☐
																		☐

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
- ☑ Standard ☐ No QC
- ☐ DQA*
- ☐ ASP A* ☐ ASP B*
- ☐ NJ Reduced* ☐ NJ Full*
- ☐ Tier II* ☐ Tier IV*
- ☐ Other: _____

State-specific reporting standards:

Required MLs:
benzene 2 µg/L
naphthalene 5 µg/L
benzo(a)pyrene 0.1 µg/L

Relinquished by:	Received by:	Date:	Time:
		10/31/16	12:20
		10/31/16	1644

Temp °C
Observed: 0.8
Correction Factor: 0
Corrected: 0.8
IR ID #: 07

☐ EDD format: _____
☑ E-mail to: aadams@gulfoil.com, cgill@gulfoil.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☑ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen